II. REMARKS

Upon entry of the present Amendment, claims 44-62 will be pending. Claim 44 is pending. Claims 45-62 have been added. Support can be found for these claims throughout the original specification and original claims and no new matter is believed to have been added by their introduction. The amendments to claim 44 are provided merely to enhance readability and do not add any new matter. Reconsideration is respectfully requested in light of the foregoing amendments and remarks that follow.

Applicants appreciate the Examiner's acknowledgement during the interview that the Amendments to claim 44, herein provided, would aid in overcoming the indefiniteness rejections.

A. Substitute Drawings

Submitted herewith are substitute drawings, Figures 2-7, in response to the Notice of Draftsperson's Review. Applicant's respectfully request replacement of existing Figures 2-7 with Figures 2-7 herein provided. No new matter is presented.

B. Oath Objection

In accordance with the Examiner's instructions, submitted herewith is a Supplemental Oath in compliance with 37 C.F.R. § 1.67(a). Accordingly, the Applicants respectfully request withdrawal of this objection.

C. Rejection under 35 U.S.C. § 112, paragraph 2

Claim 44 was rejected under 35 U.S.C. § 112, paragraph 2. The Examiner stated that step (a) of claim 44 is not clear because one of "ordinary skill in the art would not know what is meant by 'an arthropod sample suspected of containing arthropods.'" In light of the included amendment to claim 44, Applicants respectfully request withdrawal of this rejection.

Claim 44 was also rejected for indefiniteness because the Examiner reasoned that "it is not clear [in step (b)] if it is enough just to separate the agent/parasite from the arthropod or if it

will require additional treatment to expose the analyte." (Page 3). This step describes what treatment is required to place an arthropod sample into testable condition. Applicants respectfully direct the Examiner's attention to the specification at page 8, lines 5-8. These lines describe the preferred embodiment of how a given arthropod sample is to be treated prior to contacting this sample with the liquid permeable support. These lines reference Example 3 for added clarification. Example 3 describes obtaining analyte from mosquitoes by grinding mosquitoes in solution. In addition, Applicants would like to direct the Examiner's attention to Figure 2 where the procedure diagram explains how analyte may be obtained and tested. Therefore, the specification makes clear what step (b) entails. Based on this and the foregoing amendment to step (b), Applicants respectfully request withdrawal of this rejection.

D. Rejection under 35 U.S.C. § 103

1. Aspects of the Invention

For the instant invention to function as claimed, the exposure of the analyte in step (b) is followed by touching the liquid permeable support of step (c) to the sample of step (b) (including the exposed analyte). Although the arthropod sample is placed in testable condition subsequent to step (b), this condition is dependent on the physical circumstances of step (c). It is believed that the capillary flow or "wicking" of the sample, once touched to the support, provides the further purification of the sample required to enhance the successful use of the present invention. Preferably, as indicated in Figure 2, this flow is vertical flow. Therefore, while in the section 112 rejection the Examiner is asking what is required to expose the analyte in step (b), it is important not to confuse this step with the state of the analyte in step (c) at the point where it binds to form the analyte-reagent complex.

Claim 44 was also rejected under 35 U.S.C. § 103. To support this rejection, the Examiner cited two references that purportedly render the instant invention unpatentable due to obviousness. These references are Oprandy et al. ((1990) J. Clin. Microbiol. 28(8): 1701-03) (Oprandy) in view of Huang et al. (US Patent No. 5,712,172) (Huang). In particular, the

Examiner reasons that it would be obvious to use the antibody detection reagents taught by Oprandy and apply them to the lateral flow device taught by Huang to arrive at the instant claim. For the following reasons, Applicants respectfully request reconsideration of this ground for rejection.

2. The Primary Reference - Oprandy

Oprandy relates to a dot-blot immunobinding assay for detecting arthropod agents. Oprandy proposes that analyte obtained from homogenized mosquitoes can be tested through a multiple step process. This process entails the steps of purifying the sample through a premembrane filter, binding a spot of solubilized antigen to a high protein binding capacity membrane, then applying monoclonal antibody to the bound antigen. Oprandy does not teach a permeable support which facilitates separation of arthropod artifacts from analyte through capillary flow or diffusion. This reference also does not teach an analyte-specific reagent immobilized onto the support over which the sample is allowed to become purified and then immobilized by a capture reagent adapted for capturing unbound analyte or an analyte-reagent complex.

Accordingly, Oprandy does not disclose step (c) of the presently claimed invention.

3. The Secondary Reference - Huang

The Examiner alleges that, while Oprandy does not teach a lateral flow device for the detection of the analyte, the Huang reference does. Huang relates to a lateral flow immunochromatographic assay, however, it is not obvious to combine Huang with Oprandy to arrive at the instant invention.

The Huang reference contemplates using liquid biologic samples, preferably urine; these proposed samples are "crude," in that they require no processing prior to analysis. Huang discloses a device that is placed directly in the testing sample stream (See US Patent No. 5,712,172 column 8, lines 40-42). The Huang reference fails to disclose a method whereby arthropod artifacts are separated from the analyte for testing through vertical capillary flow. In

fact, the Huang reference completely fails to mention arthropods or arthropod-carried agents as potential analytes. Similarly, this reference fails to teach antibodies specific for arthropod-borne disease.

4. Motivation and Inoperability

A motivation, suggestion or teaching to combine references must be present otherwise a combination thereof is not considered obvious. *See In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Requisite motivation requires a desirable combination of references rather than a combination of what is feasible. *See Winner Int'l Royalty Corp. v. Ching-Rong Wang*, 53 USPQ2d 1580, 1587 (Fed. Cir. 2000). "Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be 'clear and particular.'" *Id.* at 1586-87 (quoting *In re Dembiczak*, 50 USPQ2d at 1617 (citations omitted)). It is "not permissible to use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596 (Fed. Cir. 1988); *see also Ecolochem, Inc. v. Southern Cal. Edison Co.*, 227 F.3d 1361, 1372, 56 USPQ2d 1065, ___ (Fed Cir. 2000).

The need to survey insect populations for the efficacy of insect control problems does not provide the required motivation to use Oprandy with Huang to arrive at the present claims. Although the combination might have been feasible, these references do not present a motivation, nor render the present invention a desirable combination of the two cited references. As Oprandy's examples provide (and as acknowledged by the Examiner during the interview), Oprandy's method generally requires the use of laboratory facilities. Oprandy states however, that the method disclosed is readily adapted for field use. See Oprandy p. 1701, column 1. No guidance on this adaptation is provided. Due to it's limited disclosure (discussed above), adaptation of Oprandy's method for field use would most likely involve a modification of the disclosed method within a limited scope. As Oprandy provides, "[t]his system is unique in that it

involves a two-step process that solubilizes antigen and microfilters debris and immobilizes target molecules onto a solid phase." Page 1701, column 1. Absent a reference that presents a desirability to adapt outside of this scope, an adaptation of Oprandy's method for field use must be commensurate with this key aspect. Presumably, this adaptation would not involve changing the key components of Oprandy's method, namely the purification aspect, from a hydrophilic premembrane (microfilter) to a permeable support. Neither Oprandy nor Huang provide such a motivation, suggestion or teaching to combine. Because Oprandy contemplates adaptation of it's method for field use, it teaches away from the combination with Huang's urine assay. And, as acknowledged recently by the Federal circuit, "[r]eferences that teach away cannot serve to create a prima facie case of obviousness." *McGinley v. Franklin Sports, Inc.*, 60 USPQ2d 1001, 1010 (Fed. Cir. 2001) (citations omitted).

The Oprandy reference similarly teaches away from the present invention because Oprandy's solution to the artifact problem involves purifying the sample so that the arthropod artifacts left in the sample do not interfere with the assay (page 1703, column 2). In contrast, the claimed invention allows for a more unrefined sample to be used because the sample moves along the support which physically separates the different sample components, including arthropod artifacts, via differences in their physical properties such as size. Huang contemplates the use of an unrefined sample as well. However, unlike the sample contemplated by the present invention, Huang's samples do not require processing prior to use. It is unclear where the basis lies for Examiner's assertion that a high expectation of success exists for combining various methods of Oprandy with Huang's device to achieve the present invention. As provided above, Oprandy teaches away from such a combination. But, if Oprandy were combined with Huang, it would yield a seemingly inoperable device due to modifications that would be required to produce the claimed invention (see above). As provided by the Federal Circuit, "[i]f references taken in combination would produce a 'seemingly inoperative device,' . . . such references teach away from the combination and thus cannot serve as predicates for a prima facie case of

obviousness." *McGinley*, 60 USPQ2d at 1010 (citing *In re Sponnoble*, 160 USPQ 237, 244 (CCPA 1969)).

Gaps in the cited references cannot provide a motivation to combine. "Combining prior art references without the evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability -- the essence of hindsight." *In re Dembiczak*, 175 F.3d at 999, 50 USPQ2d at 1617.

For these reasons a combination of Oprandy with the secondary reference of Huang cannot render the claimed invention obvious.

III. CONCLUSION

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 355742104100. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: _____

By: _____ for

Laurie A. Axford
Registration No. 35,053
P-50,128
Morrison & Foerster LLP
3811 Valley Centre Drive
Suite 500
San Diego, California 92130-2332
Telephone: (858) 720-5133
Facsimile: (858) 720-5125

EXHIBIT A: MARKED-UP VERSION OF AMENDMENTS TO THE CLAIMS.

44. (Amended) A method for analyzing an arthropod sample for the presence of one or more analytes associated with an arthropod-carried agent that causes a disease in mammals, said method comprising the steps of:

(a) obtaining an arthropod sample suspected of containing arthropod[s]-borne agents;

(b) grinding [treating] the sample in solution to [remove the arthropod-carried agent from the arthropods thereby exposing] expose an analyte associated with the arthropod-carried agent such that the sample contains arthropod debris after grinding;

(c) contacting a liquid permeable support with the sample from step (b) and a detectable analyte-specific reagent that binds to the analyte to form an analyte - reagent complex, wherein said support further comprises a capture reagent immobilized therein that binds to the analyte or the analyte-specific reagent or the analyte-specific reagent complex; and

(d) detecting the presence of the detectable analyte-specific reagent indicating the presence of the analyte in the sample.